

MEASLES CASE AND OUTBREAK 'QUICKSHEET'

California Department of Health Services - updated December 2004

Infectious agent: The measles virus is a paramyxovirus, genus *Morbillivirus*.

Mode of transmission: a) Person to person - via large respiratory droplets (most common) or b) Airborne via aerosolized droplet nuclei (tiny droplets suspended in the air for up to 2 hours).

Communicability: Highly communicable; > 90% secondary attack rate among susceptible persons.

Susceptibility: During a measles outbreak, school-aged children, adolescents and adults born in 1957 or after, who have not received ≥ 2 doses of measles containing vaccine on or after the 1st birthday, or without laboratory evidence of measles immunity are considered to be susceptible. During an outbreak involving preschool aged children, authorities should consider extending this criterion to all children age ≥ 12 mos.

Period of communicability: Immunocompetent persons with measles are infectious from 4 days before rash onset until 3-4 days after rash onset.

Exposure: Exposure is defined as sharing the same air space (room, waiting area) with a measles case or within two hours after the case has left the area.

Incubation period: Exposure to prodrome averages 10-12 days; exposure to rash onset averages 14 days (range, 7-18 days).

CDC CASE DEFINITION and CLASSIFICATION (for purposes of public health reporting)

Clinical Case Definition: A generalized maculopapular rash of at least 3 days duration; AND a fever $\geq 101.0^{\circ}\text{F}$ ($\geq 38.3^{\circ}\text{C}$); AND cough, coryza, or conjunctivitis.

Case Classification

- **Suspected:** Any febrile illness accompanied by rash
- **Probable:** A case that meets the clinical case definition, has noncontributory or no serologic or virologic testing, and is not epidemiologically linked to a confirmed case.
- **Confirmed:** A case that is laboratory confirmed OR that meets the clinical case definition and is epidemiologically linked to a confirmed case.

CLINICAL FEATURES

Prodrome: Begins 10-12 days after exposure; generally lasts 2-4 days, with a maximum range of 1-7 days; Fever and malaise for about 24 hours; fever gradually increases often as high as $103-105^{\circ}\text{F}$; Cough, coryza (runny nose), and conjunctivitis. Koplik's spots (pin-point, depressed blue/white spots on bright red background on the buccal mucosa) may occur 1-2 days before rash onset to 1-2 days after rash.

Rash: Maculopapular, usually lasting 5-6 days. Begins at the hairline, then involves the face and upper neck. During the next three days, gradually proceeds downward and outward, reaching extremities last; less pronounced on hands and feet. The maculopapular lesions are generally discrete, but may become confluent, particularly on the upper body. Rash fades in the same order that it appears, from head to feet.

LABORATORY TESTING AND CONFIRMATION

- Significant rise in IgG antibody levels between acute phase and convalescent phase sera.
- Positive serologic test for measles IgM antibody in serum collected 2-28 days after rash.
- Isolation of measles virus from an urine or nasopharyngeal specimen. Early in the measles infection (late prodromal/early rash stage) the specimen of choice is a throat swab. The specimen of choice later in the infection is a urine sample.

REPORTING AND NOTIFICATION

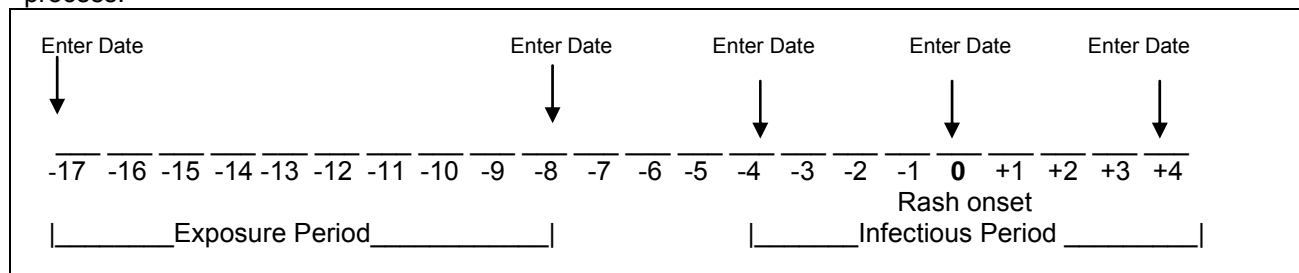
Both confirmed and probable measles cases must be reported to DHS.

STEPS FOR MEASLES CASE INVESTIGATION

1. Confirm clinical signs and symptoms (**at a minimum:** rash, fever and cough or coryza or conjunctivitis) and verify that suspected case could be susceptible to measles (check vaccination and disease history). Try to determine if suspected case was in contact with a person with measles.
2. Ensure that case is isolated immediately and remains isolated until 5 days after rash onset.
3. Arrange for serological and/or virologic testing of suspected case.
4. Identify susceptible contacts.
 - Identify all household contacts and determine those who do not have measles immunity.
 - Identify all other contacts (include persons sharing the same air space during the time and for two hours after the case was present and not masked) and determine those who do not have measles immunity.

5. Refer susceptible contacts for post-exposure prophylaxis.
 - If case occurs in a school/daycare center, a notification letter should be sent to parents. A school measles immunization record audit should be conducted and non-vaccinated children should be excluded from school until they can provide proof of immunity or until 3 weeks after onset of rash in the last reported case.
 - If case occurs in a healthcare setting, exposed personnel who do not have documented immunity to measles should be removed from all patient contact and excluded from the facility from the 5th day after first exposure until the 21st day after the last exposure, regardless of whether they receive post-exposure vaccine.
6. Local health departments may consider quarantining exposed, susceptible contact(s) from the 5th day after the first exposure until the 21st day after the last exposure (28 days if IG was given).
7. Determine the possible source of exposure (within two weeks prior to rash onset)

The following time line depicts the clinical course of measles and may be useful in the investigation process:



RECOMMENDED PROPHYLAXIS FOR EXPOSED SUSCEPTIBLE PERSONS

- For most susceptible persons aged ≥ 12 months, administration of MMR is preferable to using immune globulin (IG). If administered within 72 hours of initial exposure, MMR may provide some protection. MMR is not recommended for postexposure prophylaxis in immunocompromised or pregnant persons.
- IG can prevent or modify measles in a non-immune person if given within 6 days of exposure. IG is indicated for susceptible contacts at high risk for developing severe measles, including some infants < 12 months of age, pregnant women, immunocompromised persons and others for whom the vaccine is contra-indicated.
- Severely immunocompromised patients and other symptomatic HIV-infected patients exposed to measles should receive IG, regardless of vaccination status because they may not be protected by the vaccine.
- Infants < 6 months of age are usually immune because of passively acquired maternal antibodies. However, if measles is diagnosed in a mother, unvaccinated children in the household who lack evidence of measles immunity should receive IG.

Recommended prophylaxis for exposed susceptible persons

Prophylaxis	Infants, Children and Adults	Pregnant or Immunocompromised persons
Measles containing vaccine (MCV)*	Persons who lack either adequate documentation of vaccination or other acceptable evidence of immunity should be vaccinated. For susceptible persons aged ≥ 6 months who are household contacts of measles of patients, use of vaccine within 72 hours is also acceptable	MCV is not recommended for postexposure measles prophylaxis in severely immunocompromised persons, pregnant women or persons with other contraindications
Immune globulin (IG)**	IG is indicated for susceptible household contacts, particularly those for whom the risk of complications is increased: Some infants < 12 mos.; pregnant women, immunocompromised persons	Exposed symptomatic HIV-infected and other immunocompromised persons regardless of their previous vaccination status and susceptible pregnant women should receive IG.

*MCV may provide protection in some cases if given within 72 hours of exposure. If exposure does not result in infection, the vaccine should induce protection against subsequent measles exposures.

**IG may prevent or modify measles in a susceptible person, if given within 6 days of exposure.